



ORPC Alaska, LLC
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October 8, 2009

MEMORANDUM

VIA EMAIL

TO: Cook Inlet Stakeholder

FROM: Monty Worthington *mworthington@oceanrenewablepower.com*

SUBJECT: **ORPC Cook Inlet Tidal Energy Project Status Report No. 4**
FERC Permit No. P-12679

Study Activities completed September 2009

Pre-Deployment Beluga Observations

The beluga whale observations were continued in September with a total of 14 observation days (111.33 hours) from the observation tower set near Race Point on Fire Island. Beluga whales were not observed within the Deployment Area but were observed on five of the 14 observation days outside of the Deployment Area, generally near the Susitna River area. Observers also noted a possible single beluga near the observation point on Fire Island. Harbor seals were observed on three of the 14 observation days near Fire Island and offshore, but not within the Deployment Area. LGL's monthly progress report for beluga monitoring is attached for reference and includes figures locating the beluga and seal sightings.

Pre-deployment hydroacoustic fish surveys

Surveys were completed September 3rd and 23rd, the respective trip reports are attached to this report. The September 3rd survey conditions were good and all three sub-surveys (ebb and flood tide and evening) were completed. Drift gill nets set at different depths and surface trawls were conducted for target verification. No fish were collected in the drift gill nets but a total of 1.25 hours of trawling time resulted in the following catch:

Trawl #1 3 three-spine stickleback (20 millimeters), 2 nine-spine stickleback (40 millimeters), 46 amphipods (15 to 20 millimeters), 150 shrimp (10 to 60 millimeters).

Trawl #2 20 three-spine stickleback (20 millimeters), 221 amphipods (15 to 20 millimeters), and 231 shrimp (10 to 60 millimeters).

The September 23rd survey also completed all three sub-surveys and conditions remained good for collecting both down-looking and side-looking transducer data. Drift gill nets set at different depths and surface trawls were conducted for target verification. The gill nets resulted in no fish caught but the surface trawl collected:

Trawl #1 4 three-spine stickleback (20 millimeters), 1 nine-spine stickleback (35 millimeters), 6 amphipods (15 to 20 millimeters), 28 shrimp (10 to 60 millimeters).

Trawl #2 4 three-spine stickleback (20 millimeters), 83 amphipods (15 to 20 millimeters), and 58 shrimp (10 to 60 millimeters).

A third September fish survey event was scheduled for the last week in September in place of the third week of October due to the dock removal. However, weather conditions prohibited a successful trip. An attempt was made on September 30, 2009 but was aborted due to weather. The survey crew uses a combination of NOAA marine and land forecasts and boat captain experience in the go or no go decisions. After review of various weather forecast reports and launch site observations, the crew determined conditions were within the established safety thresholds and attempted to conduct the survey. However, once on the water the crew experienced winds to 25 knots and seas to 3 feet; combined with lack of daylight these conditions exceeded the safety threshold and the survey was called off. A trip report for this event is also attached to this status report. The crew is on standby pending safe weather conditions.

The preliminary hydroacoustic data analysis for the August 25th and September 3rd survey events have been completed and are attached to this status report. Target depth information is referenced to the National Oceanic and Atmospheric Administration's predicted mean lower low water elevation. A more complete data analysis including 3-D graphics will be provided in the study report.

The water quality data for July 29th through September 23rd has been received and is also attached to this status report. Salinity, dissolved oxygen (DO), and temperature continue to remain uniform with depth while turbidity levels are variable. Salinity and DO levels remained within a narrow range of 9 to 11.3 psu (practical salinity units = parts per thousand) and 9.2 to 9.5 milligrams per liter respectively, except for September 23rd when temperatures dropped slightly and DO levels increased slightly to range between 9.5 and 9.7 milligrams per liter .



Temperatures ranged from 13.4 to 14.0°C but dropped to 11.3°C on September 23. Turbidity levels varied from 237 to 509 ntu but generally increased with depth.

Velocity Survey

TerraSond has completed all stationary and mobile velocity data collection. The data is currently in post-processing.

Geo-physical Survey

TerraSond has completed all surveys (bathymetry, side-scan sonar, sub-bottom profiling and magnetometer) for the Deployment Area and the proposed subsea cable line.

Activities Proposed for the October 2009

The beluga observations will continue to consist of a minimum of three days per week in October for a total observation target of 24 hours per week, though times may need to be adjusted as daylight hours are reduced.

A final hydroacoustic fish survey is scheduled for the week of October 5th. Access to the site will be terminated once the Port of Anchorage dock facilities are removed which is scheduled for October 15th.

MTM/MW/jph

cc: E. Hauser, ORPC
D. Johnson, ORPC
M. McCann, HDR|DTA
File

ATTACHMENTS



Alaska Research Associates, Inc.

LGL Alaska Research Associates, Inc.

1101 E. 76th Avenue, Suite B,
Anchorage, Alaska USA 99518

Tel: (907) 562-3339 Fax: (907) 562-7223 www.lgl.com

Memorandum

To: Monty Worthington, ORPC AK
Mary T. McCann, HDR|DTA

From: Tamara McGuire, Marc Bourdon, Robert Kirchner, LGL

Date: October 5, 2009

Re: LGL Monthly Progress Report - September 2009

This is a progress report of a study by LGL Alaska Research Associates, Inc., sponsored by Ocean Renewable Power Company (ORPC) to monitor beluga whale presence, relative abundance, and behavior off of the north side of Fire Island, Upper Cook Inlet, Alaska. Information presented in this report provides baseline data on beluga whale presence, relative abundance, and surface behavior in and near the Cook Inlet Tidal Energy Project Deployment Area. This report covers beluga whale observation activities during September 2009.

Objectives

The study has two primary objectives:

1. Estimate the frequency of occurrence, relative abundance, and surface behavior of beluga whales in and near the Deployment Area during ice-free months of 2009.
2. Provide information to ORPC and HDR/DTA on beluga whale sightings and locations relative to the Cook Inlet Tidal Energy Project.

Monitoring Effort

Monitoring was conducted on 14 days during September 2009 (111.33 hours total, Table 1) from the observation site near Race Point, Fire Island. All monitoring for the month of September was conducted from an observation tower. Figure 1 shows the north eastern panoramic view from the tower including the Deployment Area, while Figure 2 displays the field of view from the observation tower. The observation tower provides the observers with safety from bears and moose, protection from winds and rain, and a higher vantage which reduces the need to continually prune vegetation in order to maintain an unobstructed view of the Deployment Area.

Whale sightings are presented in Table 2 and Figures 3-8. Observation teams chartered a small fixed-wing aircraft to travel daily between Anchorage and Fire Island. (On one occasion, the team stayed the night on the island due to weather that prohibited flying). Observers looked for belugas during the flights, and had a grid-cell map, a GPS, and a clinometer onboard to record the flight paths and any belugas sighted. Figure 10 displays the flight paths. There were no beluga sightings during flights in the month of September.

Environmental Conditions

Environmental conditions were recorded for every hour of observation. Sighting conditions were ranked as good, fair, or poor, based on a combination of wind, whitecaps, sun glare, rain, and fog. Sighting conditions were reported as good on six days, fair on seven days, and poor on one day. Observers were able to see to the far shore (along the Susitna Flats) on all observation days. Mean wind speed was 9.1 km/h, with values ranging from 0-24 km/h. Seas were generally calm, with a mean Beaufort Sea State of 1.7 (1 = ripples, without foam crests, and 2 = small wavelets, crests do not break). Mean air temperature was 10.8° C, with values ranging from 1.7° - 19.2° C. Rain was noted on four of the 14 field days.

Vessels and Vessel Activity

All vessel activity in or near the Deployment Area was monitored by the observation crew. The ORPC survey vessel was seen on one of the 14 observation days in September. Other vessels were observed transiting in or near the Deployment Area: tugs with barges were seen on eight days; a dive vessel was seen on four days; skiffs were seen on three days; motorized barges were seen on two days; and a tanker was seen on one day.

Bird Sightings

Observers looked for and recorded birds on the water in and near the Deployment Area during all observation days in September. Only one bird event was recorded for this month, in which approximately 25 unidentified gulls were observed.

Beluga Whale Sightings

Belugas were sighted on five of the fourteen observation days in September (Table 2). Calves were not seen. Locations of the sightings of beluga whales from Fire Island during September 2009 are shown in Figures 3 through 8. None of the beluga sightings were within the tidal project's Deployment Area. All confirmed beluga sightings occurred at distances over 4 km from the observation site, and observers had difficulty determining beluga activity, group spread, and group formation at these distances. It is also likely calves or gray belugas were missed at these distances; however, the Deployment Area is close enough to the observation site that observers are able to discern beluga activity and color, as evidenced by observations made in June 2009 of belugas near the Deployment Area. On September 8th, the observers noted a possible beluga near the observation station on Fire Island. The sighting could not be confirmed because the body of the beluga was not seen. The surface disturbance and associated exhalation

sound indicated that a beluga had likely surfaced at this location (Figure 8). It is possible that this sighting could have been confused with a harbor seal that was observed in the same vicinity during the same time period, although the sound heard was more consistent with a beluga exhalation than with a seal vocalization. Belugas were not seen during any of the crew-transport flights. Daily flight paths are displayed in Figure 10.

Additional Marine Mammal Sightings

Harbor seals were spotted on three of the 14 observation days. On September 16th, harbor seals were seen near the Deployment Area. See Figure 9 for harbor seal locations and dates.

Upcoming Field Research

Observation sessions for beluga whales are scheduled to be conducted 24 hours per week for each week of October. The observation schedule will initially remain three days a week with eight hours of observations per day, though it may later be altered to four shorter days a week (depending on daylight).

Table 1. Monitoring effort during September 2009 is summarized by date and location.

Day	Date	Shift start	Shift stop	Total hours of observation	Tide height start (m)	Tide height stop (m)	Belugas sighted?	Belugas sighted within Deployment Area?
1	2009SEP01	8:00	16:00	8.00	5.53	6.31	no	no
2	2009SEP02	8:05	16:05	8.00	6.78	5.49	yes	no
3	2009SEP08	8:35	16:30	7.92	8.08	1.08	yes	no
4	2009SEP09	8:30	19:30	11.00	7.03	6.67	no	no
5	2009SEP10	7:00	12:05	5.08	2.71	7.70	no	no
6	2009SEP14	9:00	17:00	8.00	0.96	7.96	yes	no
7	2009SEP15	9:00	18:00	9.00	2.18	8.55	no	no
8	2009SEP16	9:00	16:00	7.00	3.75	7.20	no	no
9	2009SEP21	9:30	17:15	7.75	9.58	3.66	no	no
10	2009SEP22	9:00	17:15	8.25	8.94	2.26	yes	no
11	2009SEP23	9:00	17:00	8.00	7.70	1.67	no	no
12	2009SEP28	9:00	17:00	8.00	1.62	7.44	no	no
13	2009SEP29	9:00	17:00	8.00	2.31	8.17	no	no
14	2009SEP30	10:40	18:00	7.33	1.14	8.50	yes	no

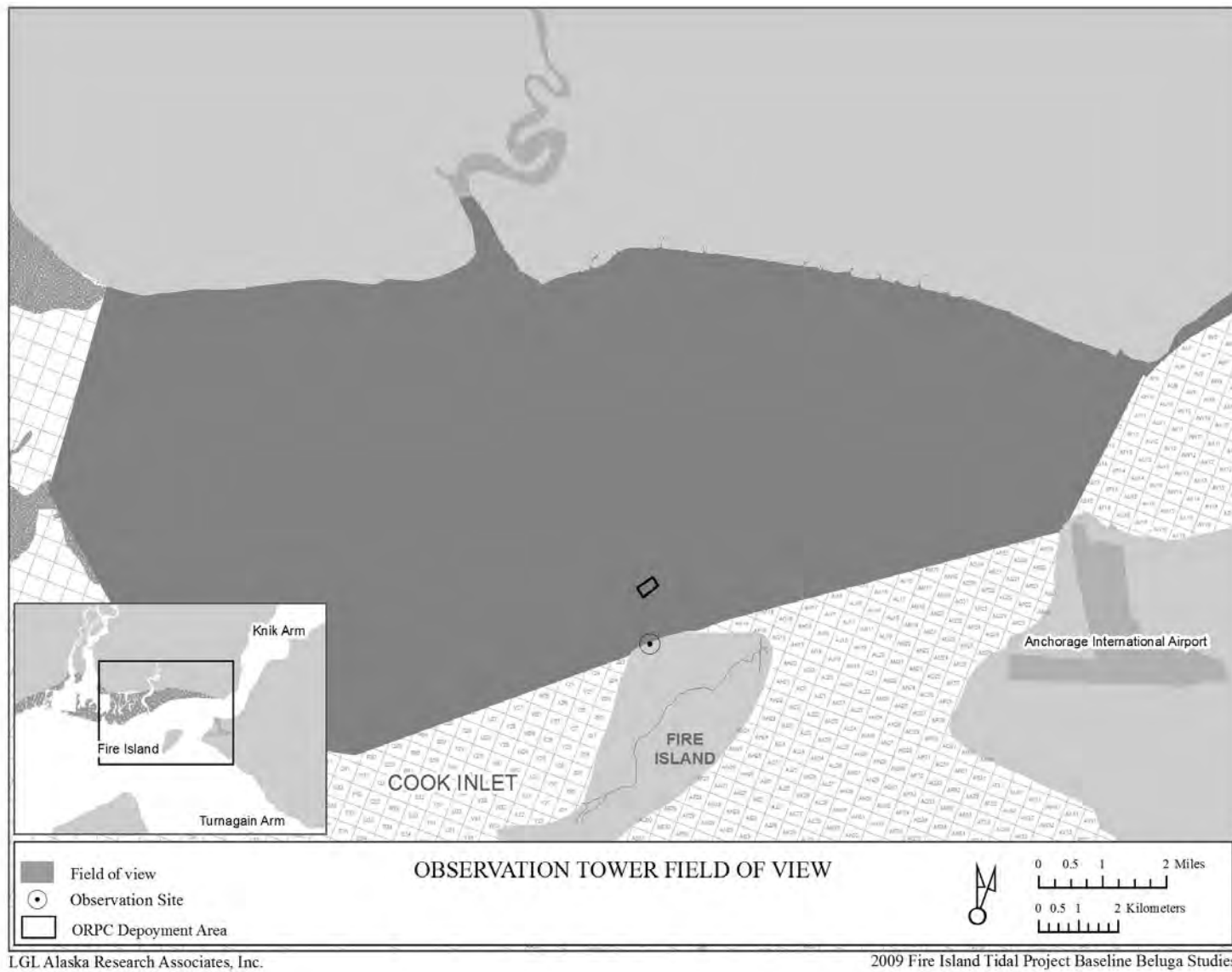
Table 2. Beluga whale sightings during September 2009 are summarized by date.

Date	Time	White	Gray	Calve	Unknown	Total	Group #	1° Activity	Spread ²	Direction ³	Formation ⁴	Belugas sighted within Deployment Area?	Comments
2009SEP02	9:00-14:05	10	0	0	0	10	1	U	1	V	U	no	
2009SEP08	11:33-14:25	16	0	0	0	16	1	U	U	U	U	no	
2009SEP08	13:05-13:05	0	0	0	1	1	2	U	N/A	U	N/A	no	Unconfirmed
2009SEP14	14:01-16:36	25	0	0	8	33	1	U	7	V	U	no	
2009SEP22	12:30-13:08	4	10	0	0	14	1	U	7	V	NF	no	
2009SEP30	10:40-16:20	54	0	0	0	54	1	U	7	V	NF	no	

1 Activity				2 Spreads (Body Length)		3 Direction		4 Formations	
Traveling	T	Resting	R	<1	1	Variable	V	Circular	C
Socialize	S	Spy Hop	SH	1-3	3			Parallel	P
Dive	D	Milling	M	4-7	7			Linear	L
Feeding Observed	FO	Other	O	8-12	12			Echelon	E
Feeding Suspected	FS	Unknown	U	>13	13			No Formation	NF
				Unknown	U			Unknown	U



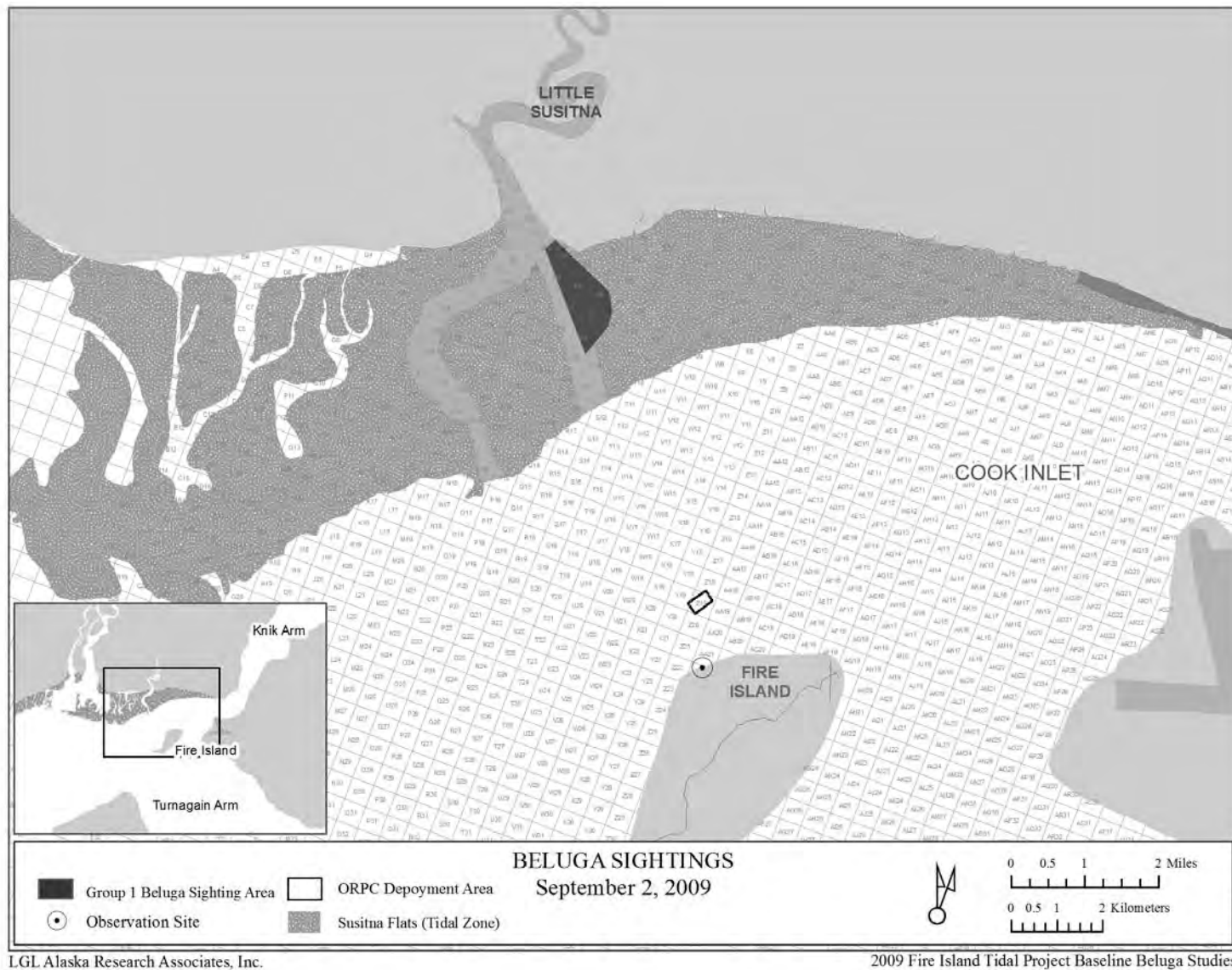
Figure 1. Panoramic view from the ORPC Fire Island observation tower. Deployment Area sits left of center.



LGL Alaska Research Associates, Inc.

2009 Fire Island Tidal Project Baseline Beluga Studies

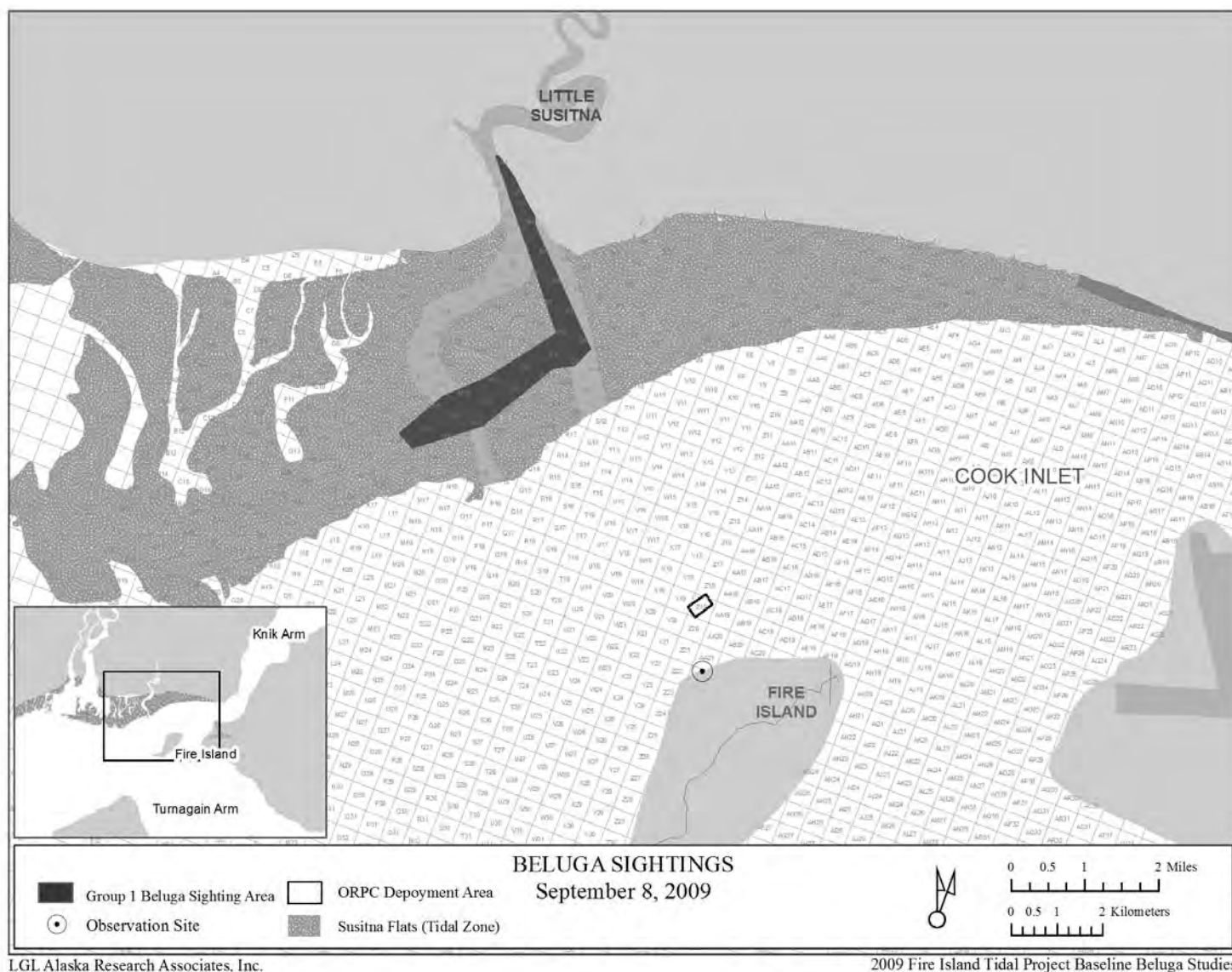
Figure 2. Field of view as seen from ORPC Fire Island observation tower.



LGL Alaska Research Associates, Inc.

2009 Fire Island Tidal Project Baseline Beluga Studies

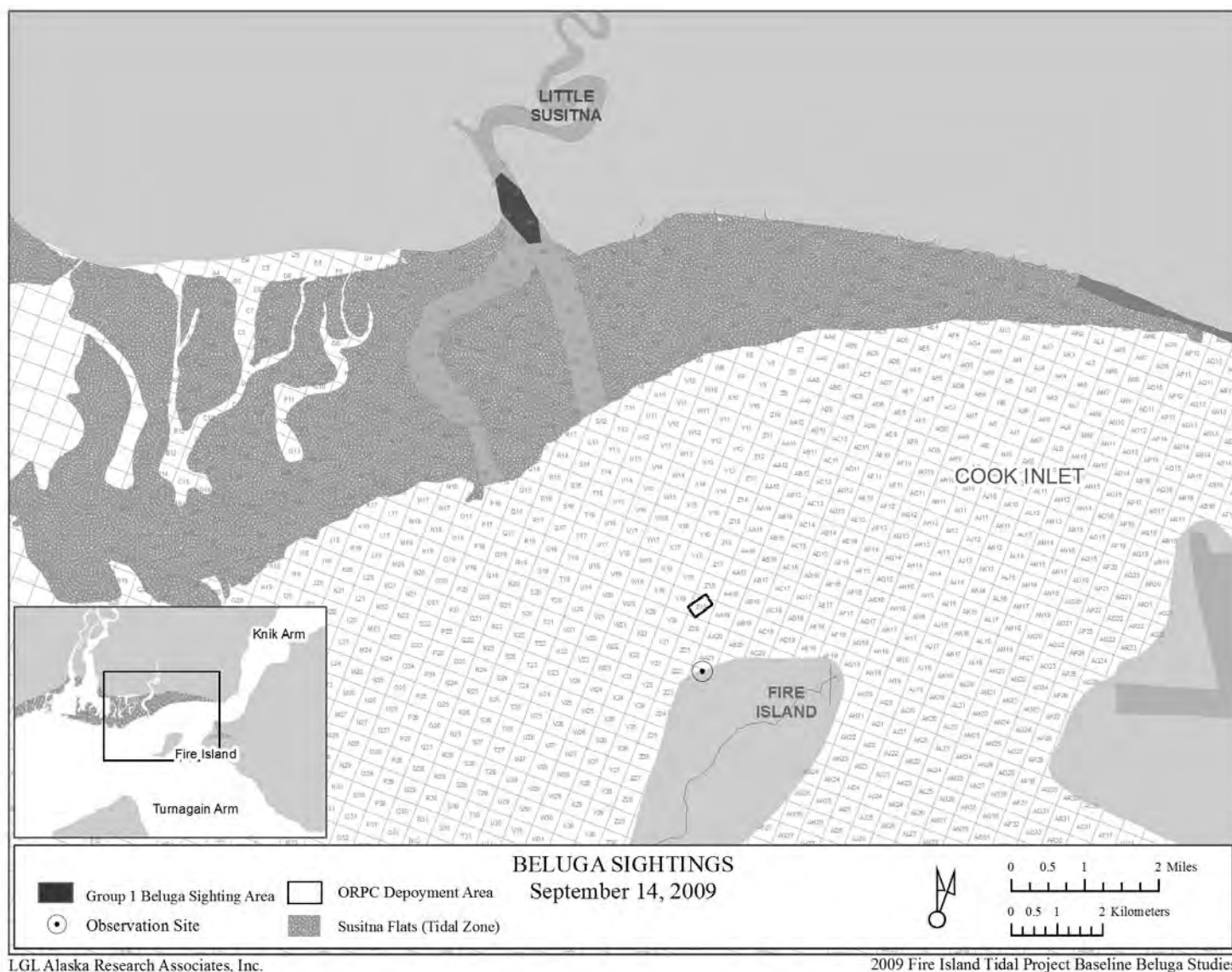
Figure 3. Locations of beluga whales sighted on September 2, 2009.



LGL Alaska Research Associates, Inc.

2009 Fire Island Tidal Project Baseline Beluga Studies

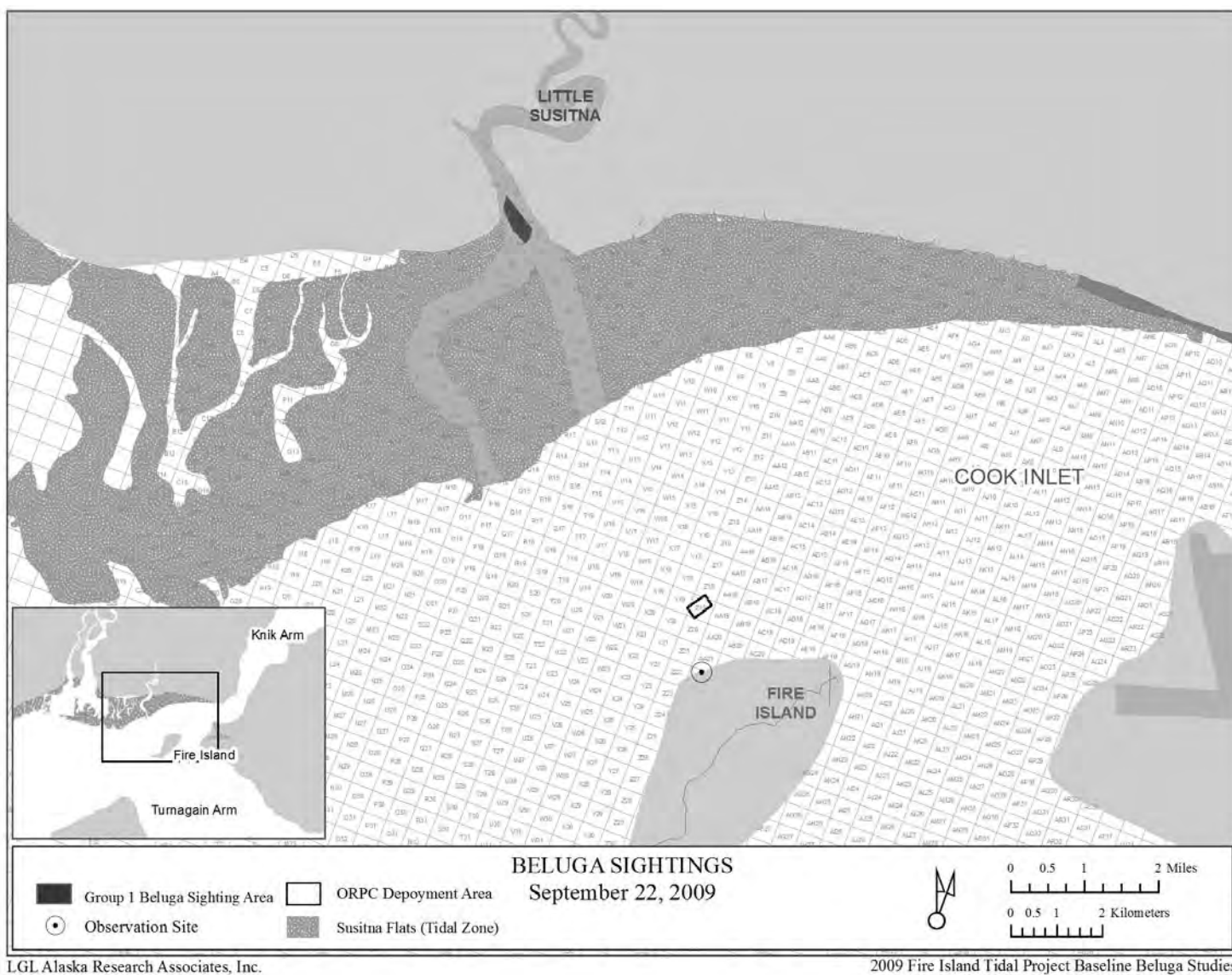
Figure 4. Locations of beluga whales sighted on September 8, 2009.



LGL Alaska Research Associates, Inc.

2009 Fire Island Tidal Project Baseline Beluga Studies

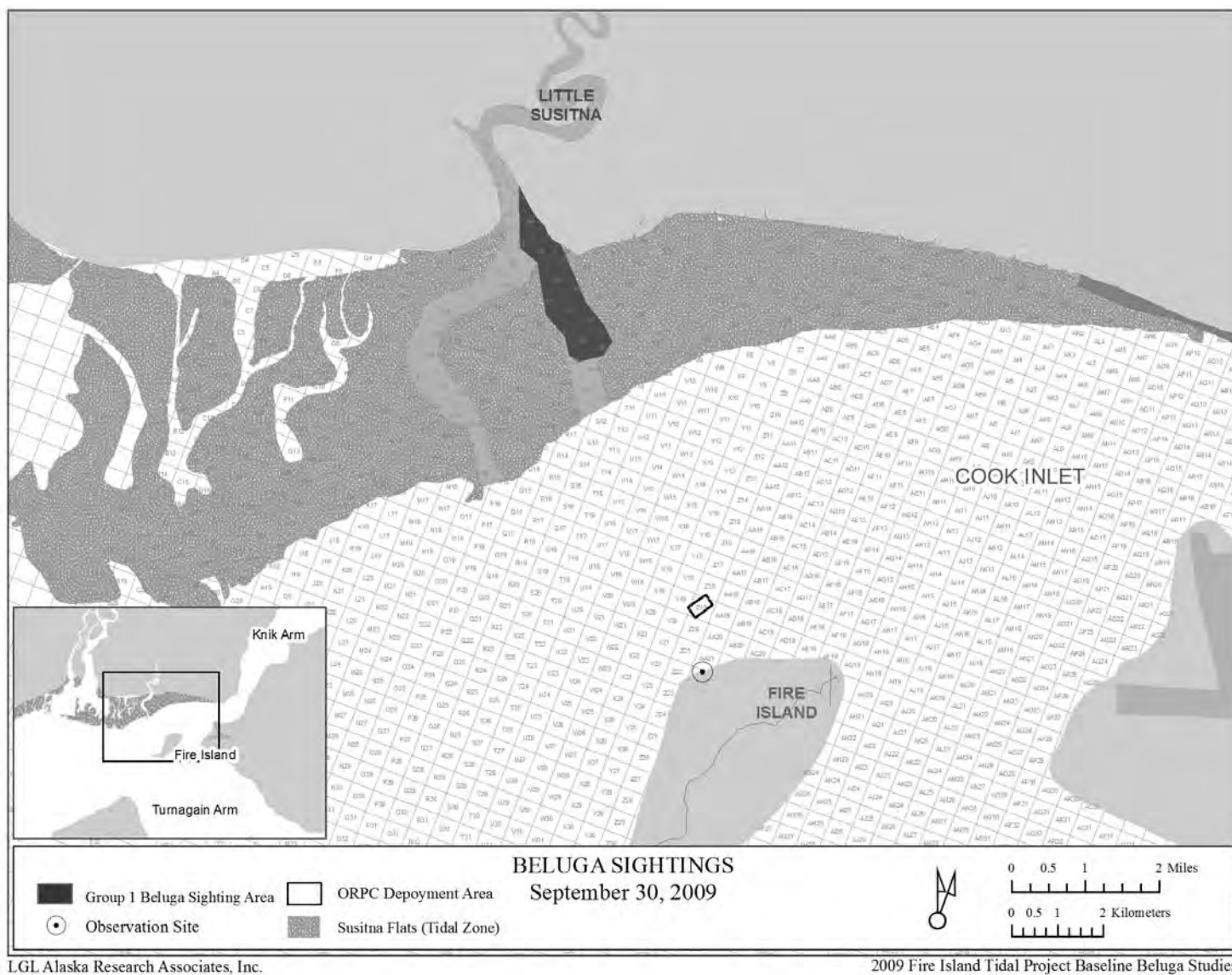
Figure 5. Locations of beluga whales sighted on September 14, 2009.



LGL Alaska Research Associates, Inc.

2009 Fire Island Tidal Project Baseline Beluga Studies

Figure 6. Locations of beluga whales sighted on September 22, 2009.



LGL Alaska Research Associates, Inc.

2009 Fire Island Tidal Project Baseline Beluga Studies

Figure 7. Locations of beluga whales sighted on September 30, 2009.

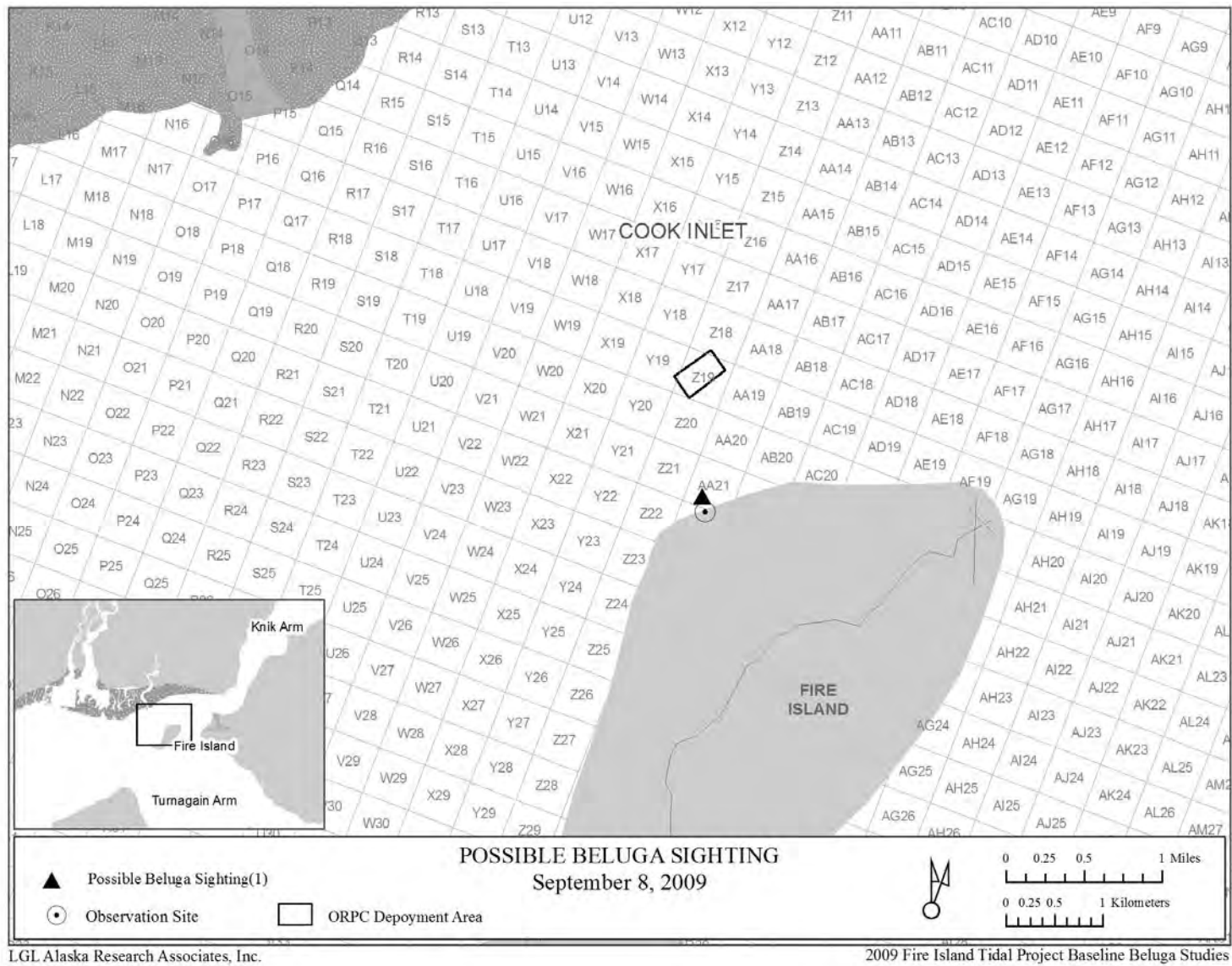


Figure 8. Location of unconfirmed beluga whale observed on September 8, 2009.

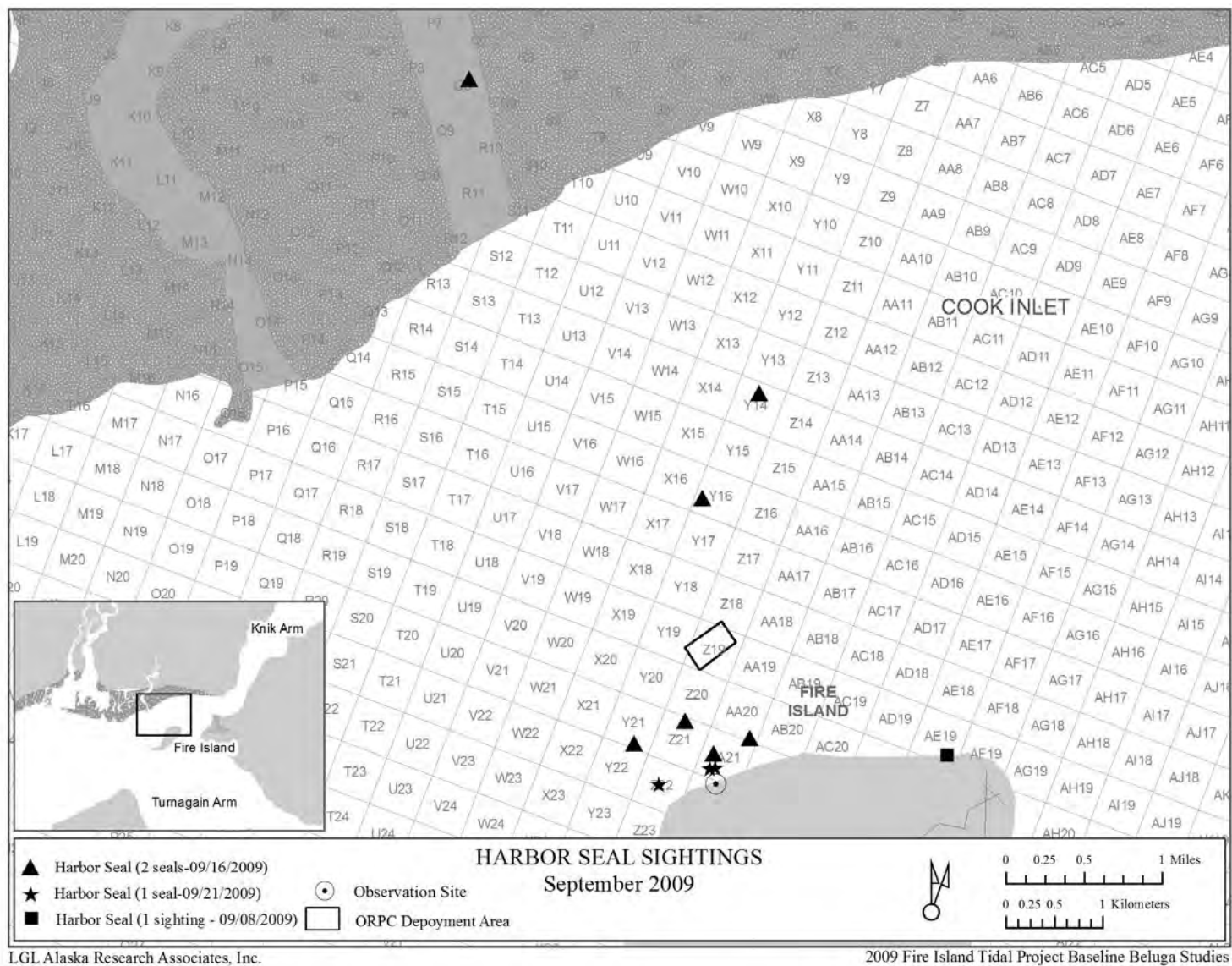


Figure 9. Locations of harbor seal sightings, September 2009.

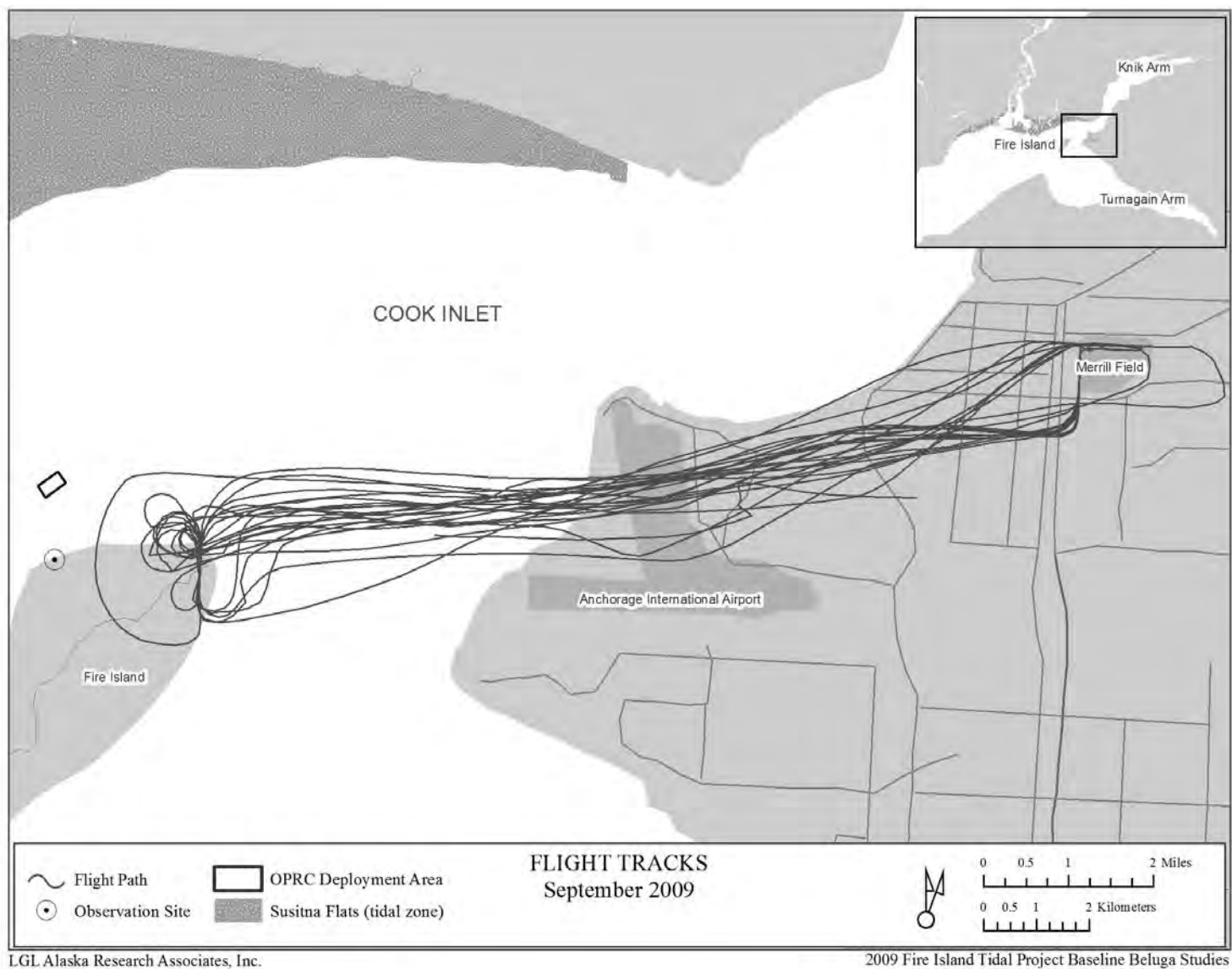


Figure 10. Paths of crew-transport flights in September 2009.

To: Mary McCann	
From: Scott Prevatte	Project: ORPC Cook Inlet Fish Survey
CC: Paul McLarnon, Don Degan, Nathan Vail	
RE: Trip Report for September 3, 2009	Event # : 08_2009

Data Collection Event: September 3, 2009

Personnel: Scott Prevatte, Patrick Blair, Mark Savoie

Weather: Morning fog then sunny, light wind from SW to 5 knots, seas variable 0-2 feet

Launch Time: 04:00 September 3, 2009

Dock Time: 17:30 September 3, 2009

Tide Prediction:

Low: 01:02 September 3

High: 06:54 September 3

Low: 13:21 September 3

High: 19:28 September 3

Daylight Prediction:

Sunrise: 06:58 September 3

Sunset: 20:59 September 3

Survey Times:

Survey 1: 06:07 to 07:23

Survey 2: 09:43 to 10:58

Survey 3: 15:25 to 16:33

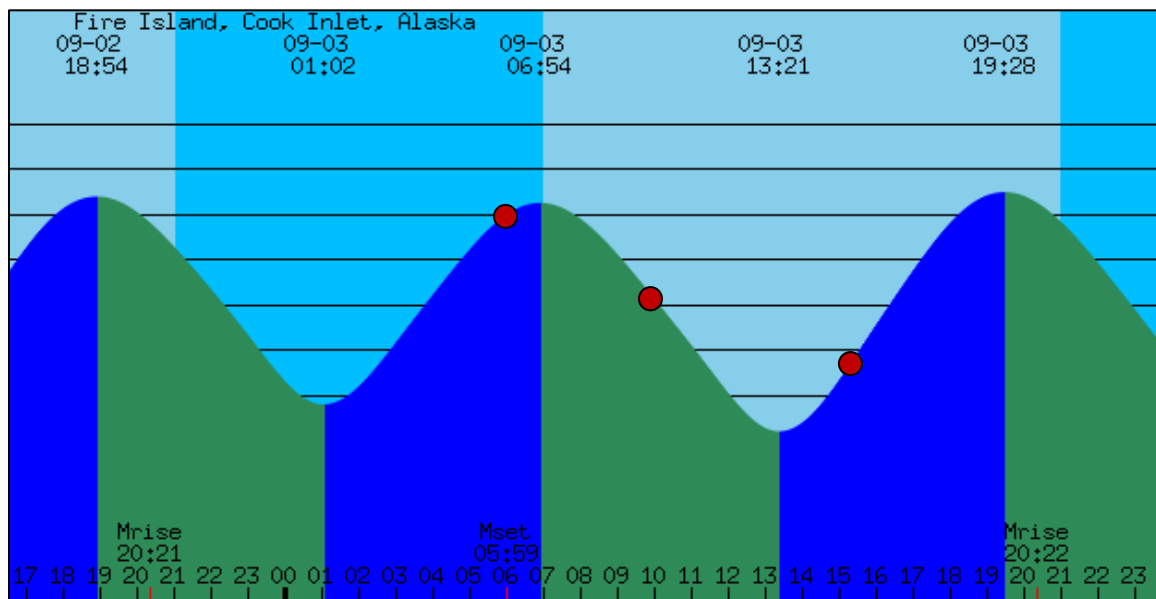


Figure 1. Tide prediction and acoustic survey times for Fire Island, AK, September 3, 2009.

Data Collection:

Down looking transducer: No noise, equipment functioned properly.

Side looking transducer: Pitch and roll due to wave action was minimal, equipment functioned properly.

Target verification: Target verification was conducted within the study area. Gill net surface drift through entire study area one times for duration of 0.25 hours and 25 feet depth two times for 0.25 hours each. Surface trawl two times for duration of 0.5 hour and 0.75 hour.

Catch:

Gill Net Surface #1 - No catch

Gill Net 25' Depth #1 & #2- No Catch

Trawl #1- 4 three spine stickleback (20mm), 1 nine spine stickleback (35mm), 6 amphipods (15-20mm), 28 shrimp (10-60mm).

Trawl #2- 4 three spine stickleback (20mm), 83 amphipods (15-20mm), and 58 shrimp (10-60mm).

Data Upload: Completed to Aquacoustics ftp site on September 4th at 10:00.

Incidental Observations:

Marine mammals: None

Birds: None

Fish: None

Boats: None

Other: Several large logs and numerous small woody debris.

Narrative:

The data collection event of September 3, 2009 took place during favorable sea conditions. HDR and Kinnetic Laboratories personnel launched the RV North Forty from Ship Creek public boat launch at 04:00. The weather was heavy fog turning mostly sunny with light wind and seas were generally less than one foot. Acoustic survey data collection was not affected by boat pitch and roll.

Gill net sampling was attempted three times within the study area. A 100 foot long by 8 foot deep experimental mesh (1" to 5") monofilament gill net was fished on the surface and at depth. The net was controlled drift through the study area near slack low and again in the opposite direction on the flood tide (Figure 1). Each drift lasted approximately 30 minutes. No fish were caught with this method.

Trawl net sampling was conducted at the surface two times, once during low and once at high tide. A modified Isaac Kid style trawl constructed of 1/4 inch mesh with a 1/8 inch zippered cod end and measuring 8 feet by 8 feet by 25 feet with aluminum frame and tow bar was deployed at approximately 125 feet behind the boat. The tows lasted approximately 30-45 minutes. Even at slack tide current made forward progress and navigation difficult. Total catch was 8 three spine stickleback at 20mm, 1 nine spine stickleback at 35mm, 89 amphipods at 15-20mm, and 86 shrimp at 10-60mm (Figure 2).

The next survey is scheduled to occur on September 23rd.



Figure 1. Controlled drift gill net sampling during calm sea conditions near Fire Island, AK, on September 3, 2009.



Figure 2. Typical large shrimp (60mm) caught in surface trawl near Fire Island, AK, on September 3, 2009.

To: Mary McCann	
From: Scott Prevatte	Project: ORPC Cook Inlet Fish Survey
CC: Paul McLarnon, Don Degan, Nathan Vail	
RE: Trip Report for September 23, 2009	Event # : 09_2009

Data Collection Event: September 23, 2009

Personnel: Scott Prevatte, Patrick Blair, Mark Savoie

Weather: Sunny, light wind from SW to 5 knots, seas variable 0-2 feet

Launch Time: 09:30 September 23, 2009

Dock Time: 23:00 September 23, 2009

Tide Prediction:

Low: 04:47 September 23
High: 10:42 September 23
Low: 16:51 September 23
High: 22:16 September 23

Daylight Prediction:

Sunrise: 07:48 September 23
Sunset: 19:53 September 23

Survey Times:

Survey 1: 12:53 to 14:09
Survey 2: 19:04 to 20:18
Survey 3: 20:36 to 21:42

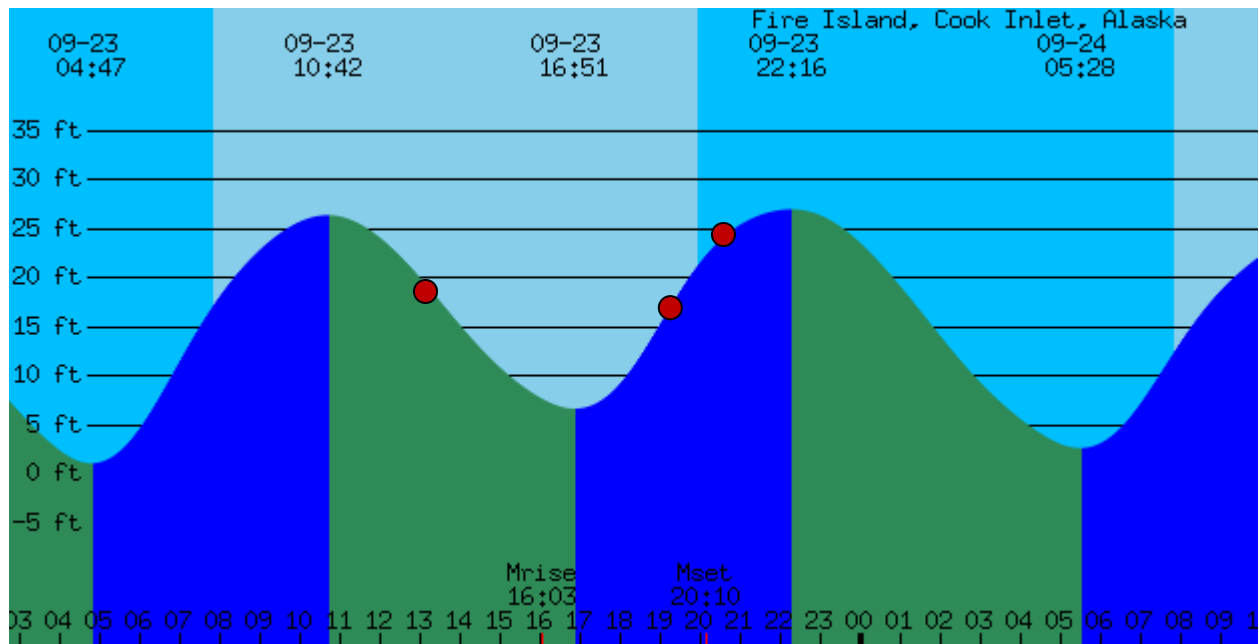


Figure 1. Tide prediction and acoustic survey times for Fire Island, AK, September 23, 2009.

Data Collection:

Down looking transducer: No noise, equipment functioned properly.

Side looking transducer: Pitch and roll due to wave action was minimal, equipment functioned properly.

Target verification: Target verification was conducted within the study area. Gill net surface drift through entire study area one times for duration of 0.5 hours and 25 feet depth one times for 0.25 hours each. Surface trawl two times for duration of 0.5 hours and 0.75 hours.

Catch:

Gill Net #1 Surface - No catch

Gill Net #2 25' Depth - No Catch

Trawl #1- 3 three spine stickleback (20mm), 2 nine spine stickleback (40mm), 46 amphipods (15-20mm), 150 shrimp (10-60mm).

Trawl #2- 20 three spine stickleback (20mm), 221 amphipods (15-20mm), and 231 shrimp (10-60mm).

Data Upload: Completed to Aquacoustics ftp site on September 25th at 13:00.

Incidental Observations:

Marine mammals: None

Birds: None

Fish: None

Boats: Terra Sond survey vessel on site in morning, departing tug and barge in morning.

Other: Several large logs and numerous small woody debris.

Narrative:

The data collection event of September 23, 2009 took place during favorable sea conditions. HDR and Kinnetic Laboratories personnel launched the RV North Forty from Ship Creek public boat launch at 09:30. The weather was clear and mostly sunny with light wind and seas were generally less than one foot. Acoustic survey data collection was not affected by boat pitch and roll.

Gill net sampling was attempted three times within the study area. A 100 foot long by 8 foot deep experimental mesh (1" to 5") monofilament gill net was fished on the surface and at depth. The net was controlled drift through the study area near slack low and again in the opposite direction on the flood tide (Figure 1). Each drift lasted approximately 30 minutes. No fish were caught with this method.

Trawl net sampling was conducted at the surface two times, once during low and once at high tide. A modified Isaac Kid style trawl constructed of 1/4 inch mesh with a 1/8 inch zippered cod end and measuring 8 feet by 8 feet by 25 feet with aluminum frame and tow bar was deployed at approximately 125 feet behind the boat. The tows lasted approximately 30-45 minutes. Even at slack tide current made forward progress and navigation difficult. Total catch was 23 three spine stickleback at 20mm, 2 nine spine stickleback at 40mm, 267 amphipods at 15-20mm, and 381 shrimp at 10-60mm (Figure 2).

The next survey is scheduled to occur on September 30th.



Figure 1. Trawl net sampling during calm sea conditions near Fire Island, AK, on September 23, 2009.



Figure 2. Typical surface trawl catch consisting of 20 three spine stickleback (20mm), 221 amphipods (15-20mm), and 231 shrimp (10-60mm) near Fire Island, AK, on September 23, 2009.

To: Mary McCann	
From: Scott Prevatte	Project: ORPC Cook Inlet Fish Survey
CC: Paul McLarnon, Don Degan, Nathan Vail	
RE: Trip Report for September 30, 2009	Event # : 10_2009

Data Collection Event: September 30, 2009

Personnel: Scott Prevatte, Erin Cunningham, Mark Savoie

Weather: Overcast, wind from N to 25 knots, seas 3-4 feet

Launch Time: 05:30 September 30, 2009

Dock Time: 6:15 September 30, 2009

Tide Prediction:

High: 05:01 September 30

Low: 11:22 September 30

High: 17:40 September 30

Low: 23:48 September 30

Daylight Prediction:

Sunrise: 08:05 September 30

Sunset: 19:34 September 30

Survey Times:

Survey 1: NA

Survey 2: NA

Survey 3: NA

Data Collection:

Down looking transducer: None

Side looking transducer: None

Target verification: None

Catch: None

Data Upload: NA

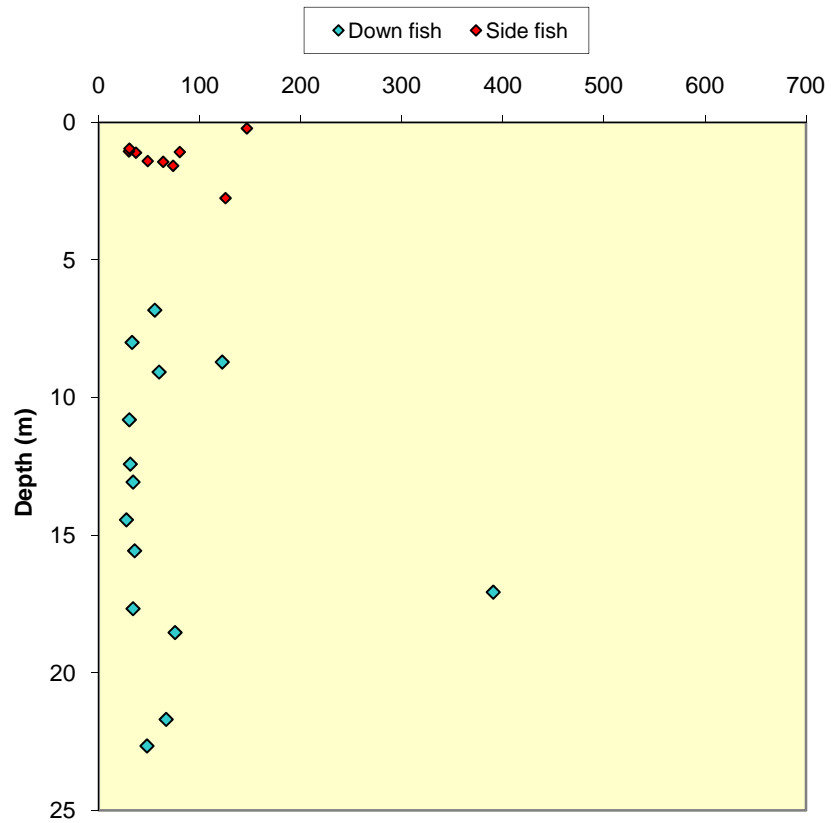
Incidental Observations: None

Narrative:

The data collection event of September 30, 2009 was aborted due to weather. The survey crew uses a combination of NOAA marine and land forecasts and boat captain experience in the go or no go decisions. The National Weather Service forecast reports are updated twice daily at 04:00 and 16:00. The forecasts released on the afternoon of September 29th predicted seas up to 2 feet north of Kamishak and English bays and no winds from Turnagain Arm which generally corresponds to calm sea state within the study area. The 04:00 report on September 30th predicted winds to 10 knots which generally has produced workable conditions but precluded surface acoustic data. Upon arriving at the boat launch at 05:00 we estimated winds to be 15 knots and expected that surface data collection and target verification might be limited however conditions at the launch are not always representative of conditions at the study site. The decision was made to launch the boat and attempt the survey as the established safety threshold is wind to 25 knots and seas to 3-4 feet. Once on the water we experienced winds to 25 knots and seas to 3 feet; combined with lack of daylight these conditions exceeded the safety threshold and the survey was called off.

The crew remains on standby for the next available survey day.

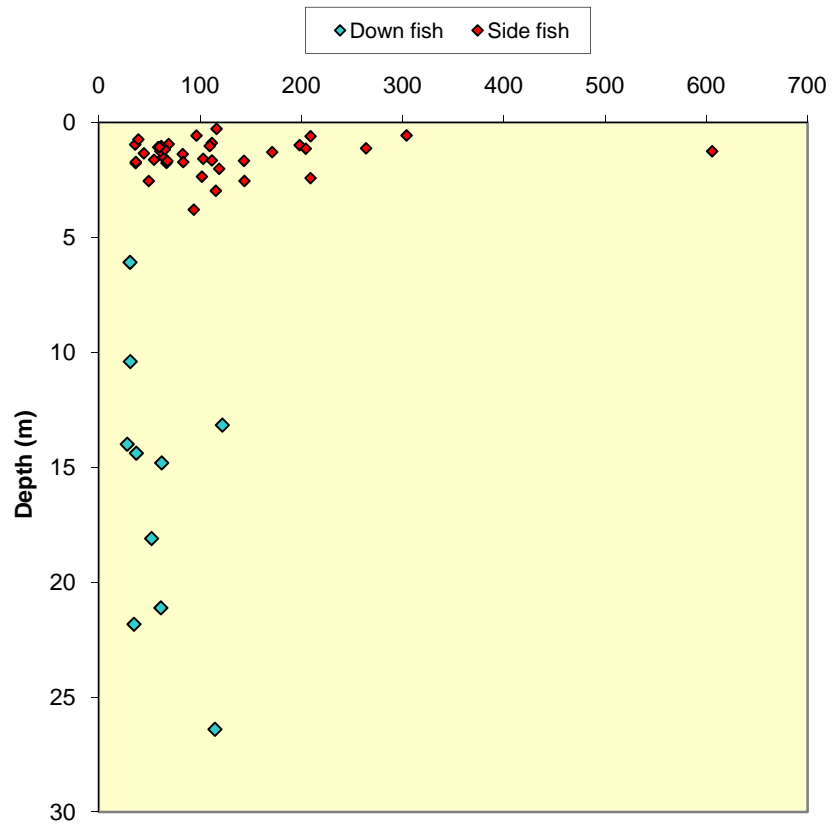
**August 25, 2009 Tracked fish size (mm) by depth
(m) sub-survey 1 - ebb tide**



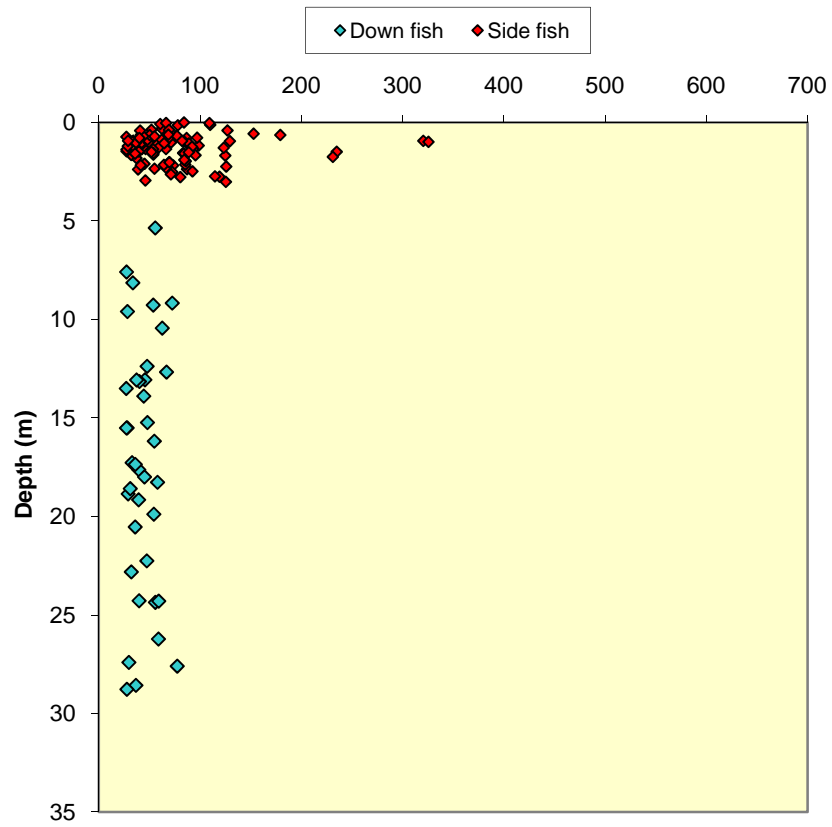
August 25, 2009 Tracked fish size (mm) by depth (m) sub-survey 2 - flood tide

Legend: ◆ Down fish ◆ Side fish

Fishing Method	Depth (m)	Size (mm)
Side fish	0.5	10
Side fish	0.5	20
Side fish	0.5	30
Side fish	0.5	40
Side fish	0.5	50
Side fish	0.5	60
Side fish	0.5	70
Side fish	0.5	80
Side fish	0.5	90
Side fish	0.5	100
Side fish	0.5	110
Side fish	0.5	120
Side fish	0.5	130
Side fish	0.5	140
Side fish	0.5	150
Side fish	0.5	160
Side fish	0.5	170
Side fish	0.5	180
Side fish	0.5	190
Side fish	0.5	200
Side fish	0.5	210
Side fish	0.5	220
Side fish	0.5	230
Side fish	0.5	240
Side fish	0.5	250
Side fish	0.5	260
Side fish	0.5	270
Side fish	0.5	280
Side fish	0.5	290
Side fish	0.5	300
Side fish	0.5	310
Side fish	0.5	320
Side fish	0.5	330
Side fish	0.5	340
Side fish	0.5	350
Side fish	0.5	360
Side fish	0.5	370
Side fish	0.5	380
Side fish	0.5	390
Side fish	0.5	400
Side fish	0.5	410
Side fish	0.5	420
Side fish	0.5	430
Side fish	0.5	440
Side fish	0.5	450
Side fish	0.5	460
Side fish	0.5	470
Side fish	0.5	480
Side fish	0.5	490
Side fish	0.5	500
Side fish	0.5	510
Side fish	0.5	520
Side fish	0.5	530
Side fish	0.5	540
Side fish	0.5	550
Side fish	0.5	560
Side fish	0.5	570
Side fish	0.5	580
Side fish	0.5	590
Side fish	0.5	600
Side fish	0.5	610
Side fish	0.5	620
Side fish	0.5	630
Side fish	0.5	640
Side fish	0.5	650
Side fish	0.5	660
Side fish	0.5	670
Side fish	0.5	680
Side fish	0.5	690
Side fish	0.5	700
Side fish	0.5	710
Side fish	0.5	720
Side fish	0.5	730
Side fish	0.5	740
Side fish	0.5	750
Side fish	0.5	760
Side fish	0.5	770
Side fish	0.5	780
Side fish	0.5	790
Side fish	0.5	800
Side fish	0.5	810
Side fish	0.5	820
Side fish	0.5	830
Side fish	0.5	840
Side fish	0.5	850
Side fish	0.5	860
Side fish	0.5	870
Side fish	0.5	880
Side fish	0.5	890
Side fish	0.5	900
Side fish	0.5	910
Side fish	0.5	920
Side fish	0.5	930
Side fish	0.5	940
Side fish	0.5	950
Side fish	0.5	960
Side fish	0.5	970
Side fish	0.5	980
Side fish	0.5	990
Side fish	0.5	1000
Side fish	0.5	1010
Side fish	0.5	1020
Side fish	0.5	1030
Side fish	0.5	1040
Side fish	0.5	1050
Side fish	0.5	1060
Side fish	0.5	1070
Side fish	0.5	1080
Side fish	0.5	1090
Side fish	0.5	1100
Side fish	0.5	1110
Side fish	0.5	1120
Side fish	0.5	1130
Side fish	0.5	1140
Side fish	0.5	1150
Side fish	0.5	1160
Side fish	0.5	1170
Side fish	0.5	1180
Side fish	0.5	1190
Side fish	0.5	1200
Side fish	0.5	1210
Side fish	0.5	1220
Side fish	0.5	1230
Side fish	0.5	1240
Side fish	0.5	1250
Side fish	0.5	1260
Side fish	0.5	1270
Side fish	0.5	1280
Side fish	0.5	1290
Side fish	0.5	1300
Side fish	0.5	1310
Side fish	0.5	1320
Side fish	0.5	1330
Side fish	0.5	1340
Side fish	0.5	1350
Side fish	0.5	136



**August 25, 2009 Tracked fish size (mm) by depth
(m) sub-survey 3 - Night**

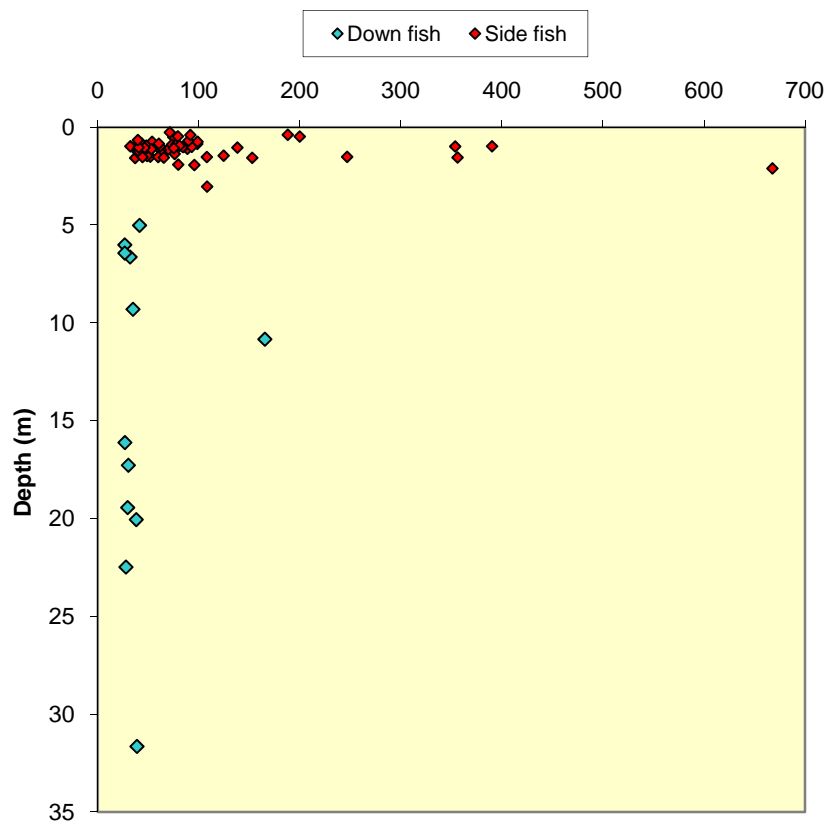


September 3, 2009 Tracked fish size (mm) by depth (m) sub-survey 1 - flood tide

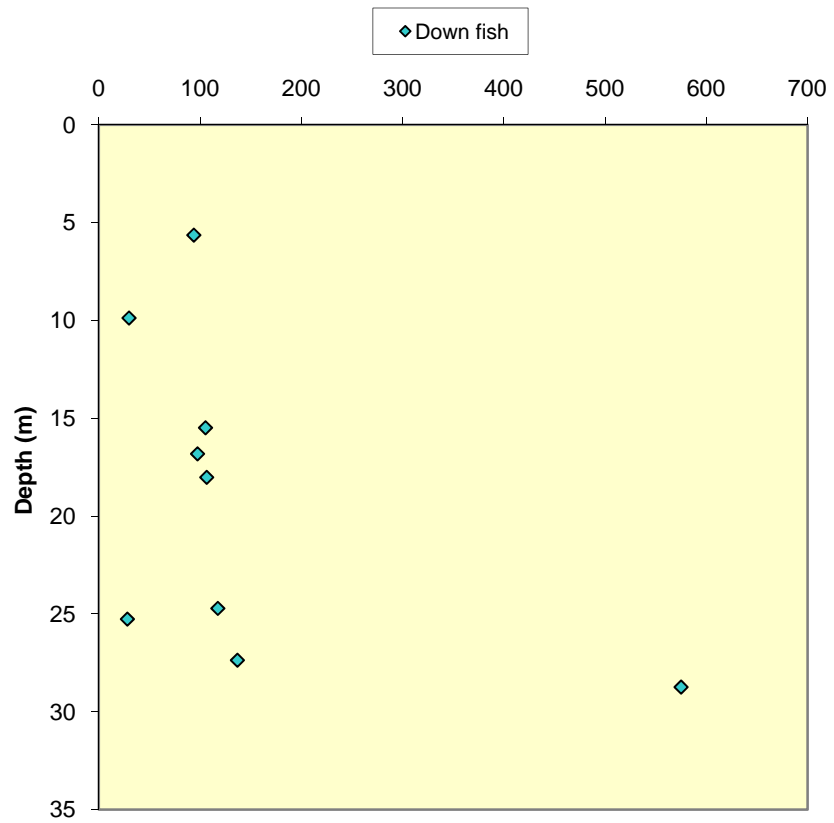
Legend: ◆ Down fish ◆ Side fish

Depth (m)

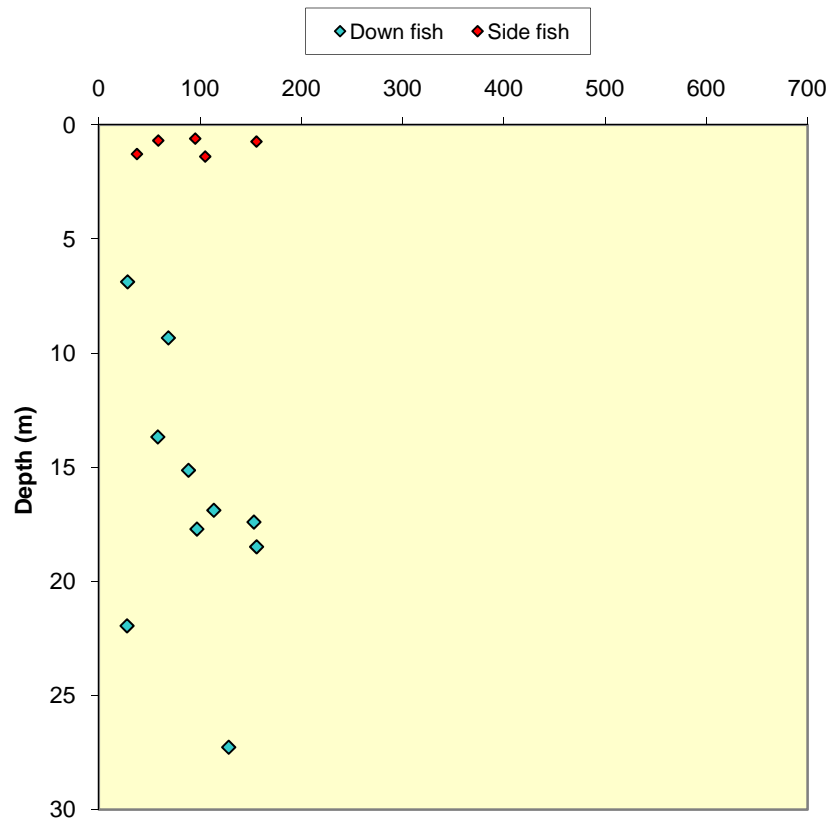
Size (mm)



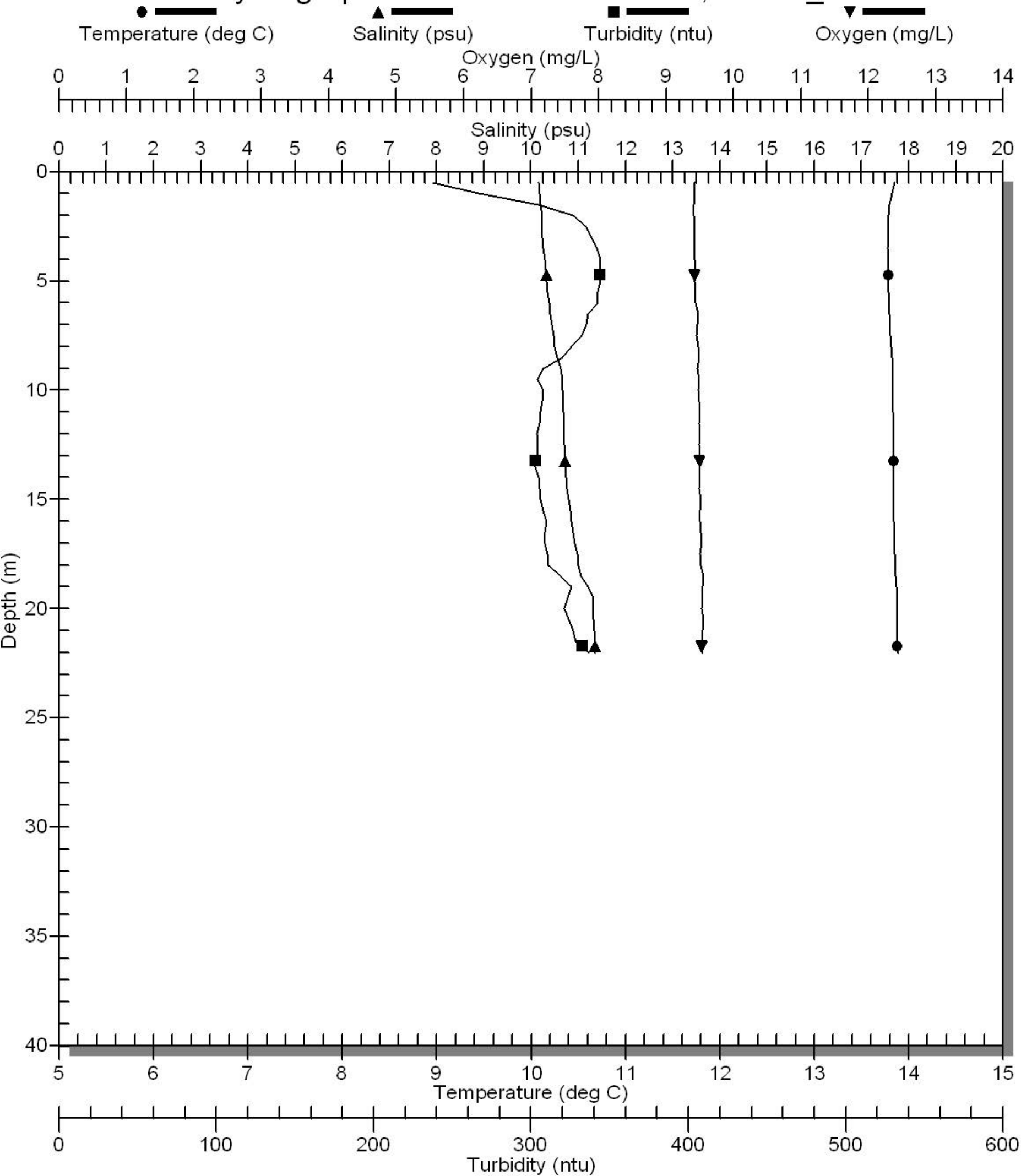
**September 3, 2009 Tracked fish size (mm) by
depth (m) sub-survey 2 - ebb tide**



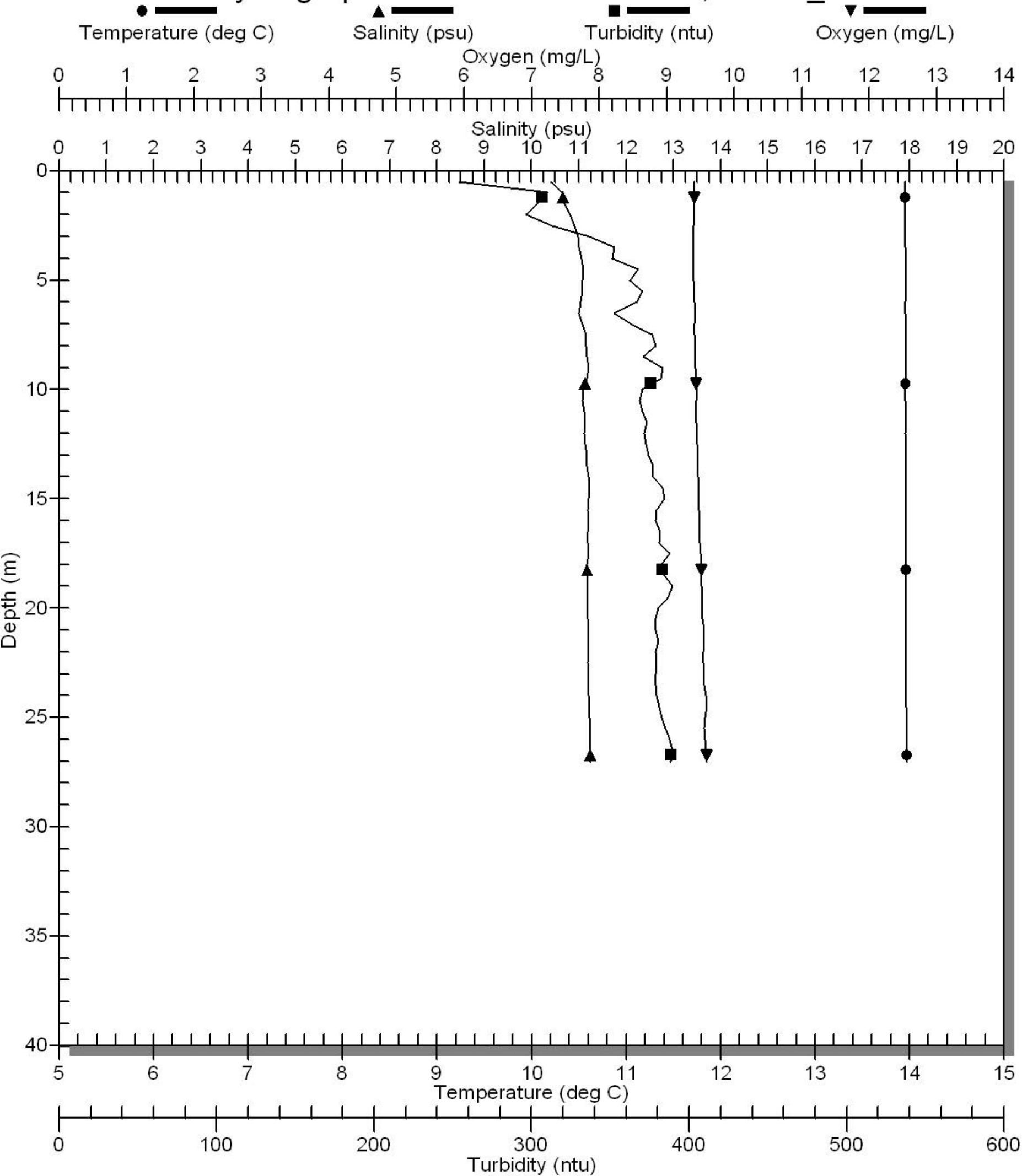
**September 3, 2009 Tracked fish size (mm) by
depth (m) sub-survey 3 - flood tide dusk**



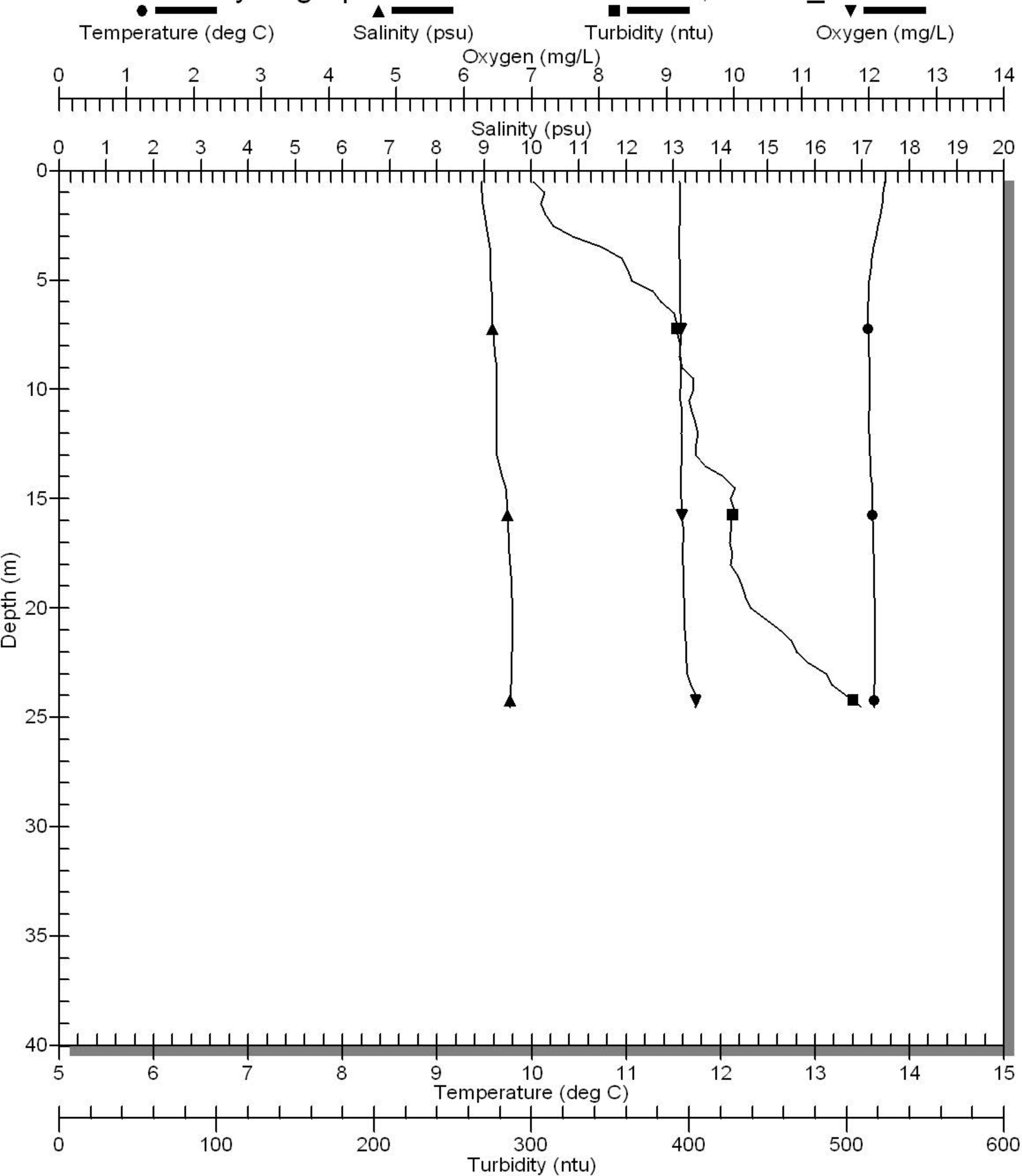
ORPC - Hydrographic Data - Summer 2009, ORPC_0729.cnv



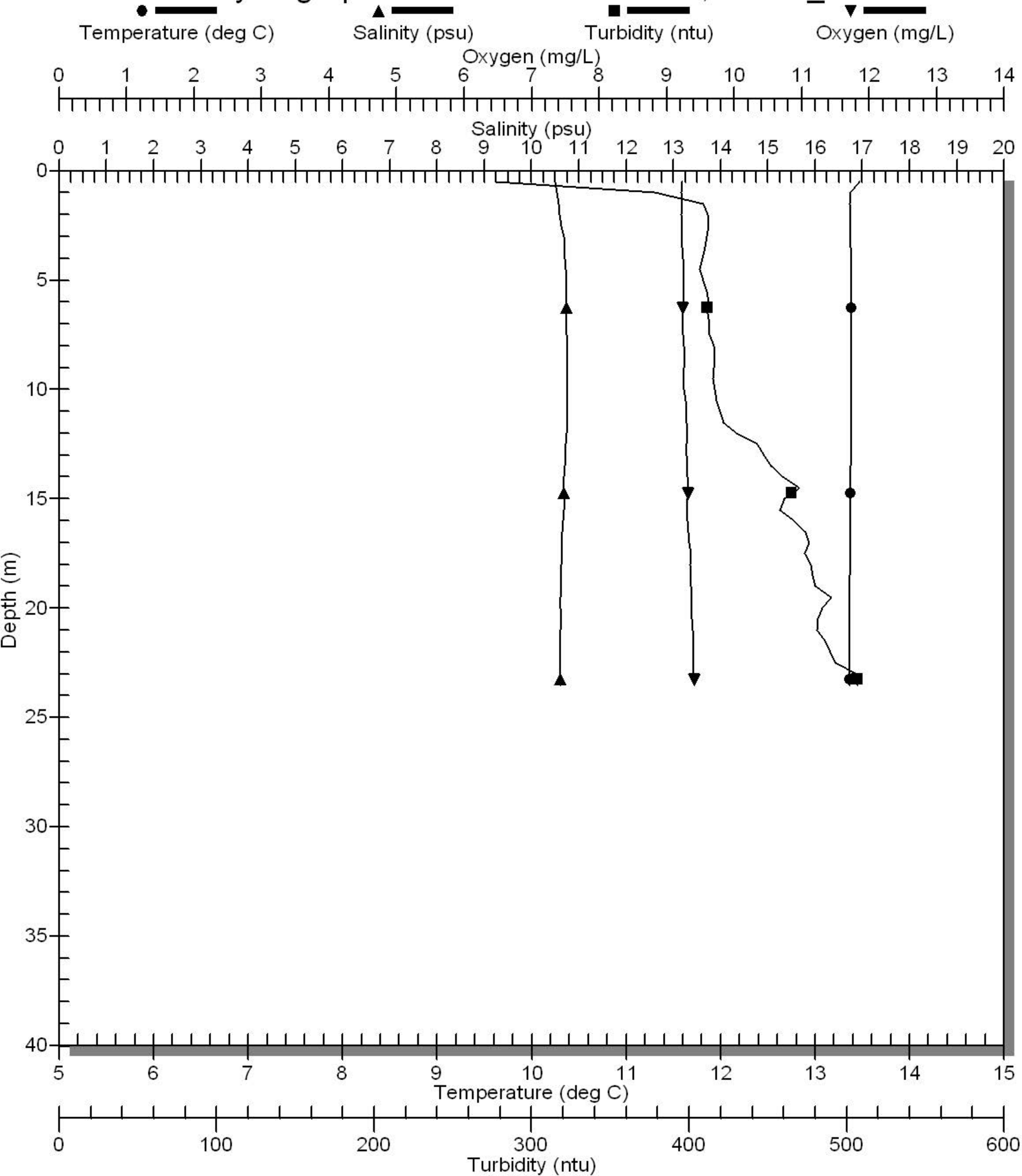
ORPC - Hydrographic Data - Summer 2009, ORPC_0805.cnv



ORPC - Hydrographic Data - Summer 2009, ORPC_0825.cnv



ORPC - Hydrographic Data - Summer 2009, ORPC_0903.cnv



ORPC - Hydrographic Data - Summer 2009, ORPC_0923.cnv

